

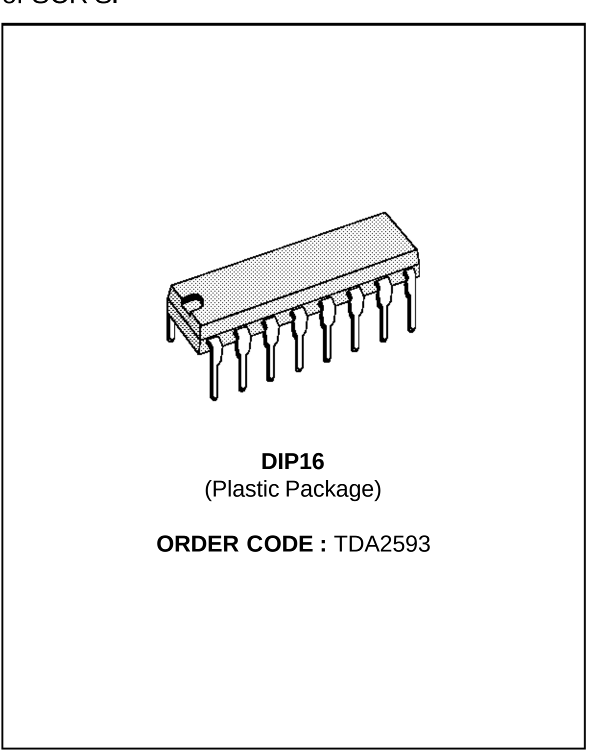
TDA2593

SYNCHRO AND HORIZONTAL DEFLECTION CONTROL FOR COLOR TV SET

- LINE OSCILLATOR (two levels switching)
- PHASE COMPARISON BETWEEN SYNCHRO-PULSE AND OSCILLATOR VOLTAGE Ø 1, ENABLED BY AN INTERNAL PULSE, (better parasitic immunity)
- PHASE COMPARISON BETWEEN THE FLYBACK PULSES AND THE OSCILLATOR VOLTAGE Ø 2
- COINCIDENCE DETECTOR PROVIDING A LARGE HOLD-IN-RANGE
- FILTER CHARACTERISTICS AND GATE SWITCHING FOR VIDEO RECORDER APPLICATION
- NOISE GATED SYNCHRO SEPARATOR
- FRAME PULSE SEPARATOR
- BLANKING AND SAND CASTLE OUTPUT PULSES
- HORIZONTAL POWER STAGE PHASE LAGGING CIRCUIT
- SWITCHING OF CONTROL OUTPUT PULSE WIDTH
- SEPARATED SUPPLY VOLTAGE OUTPUT STAGE ALLOWING DIRECT DRIVE OF SCR'S CIRCUIT
- SECURITY CIRCUIT MAKES THE OUTPUT PULSE SUPPRESSED WHEN LOW SUPPLY VOLTAGE

DESCRIPTION

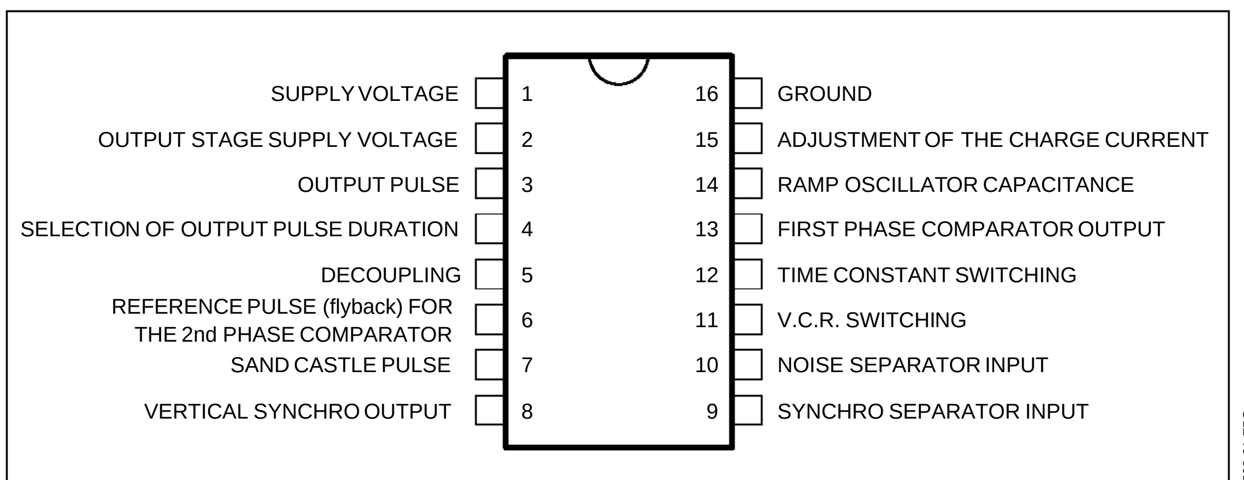
The TDA2593 is a circuit intended for the horizontal deflection of color TV sets, supplied with transistors or SCR'S.



DIP16
(Plastic Package)

ORDER CODE : TDA2593

PIN CONNECTIONS



MAIN CHARACTERISTICS

Symbol	Parameter	Typ.	Unit
V(1–16)	Supply Voltage	12	V
I(1)	Supply Current	30	mA
INPUT SIGNALS			
V(9–16) (pp)	Synchro Separator Input Voltage	3 to 4	V
V(10-16) (pp)	Noise Separators Input Voltage	3 to 4	V
 V(4–16) V(4–16) V(4–16)	Control Voltage of the Output Pulse Switching Circuit t = 7 µs (thyristor) t = 14 µs + t_d (transistor) t = 0 (V(3–16) = 0)	 9.4 to V(1–16) 0 to 3.5 5.4 to 5.6	 V V V
OUTPUT SIGNALS			
V(8–16) (pp)	Frame Synchro Pulse	11	V
V(7–16) (pp)	Sandcastle Pulse	11	V
V(3–16) (pp)	Horizontal Driver Stage Control Pulse	10.5	V

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ABSOLUTE MAXIMUM RATINGS (Maximum Ratings according to CEI 134 Datasheet)

Symbol	Parameter	Value	Unit
V(1–16)	Supply Voltage to Pin 1	13.2	V
V(2–16)	Supply Voltage to Pin 2	18	V
V(4–16)	Voltage to Pin 4	13.2	V
V(9–16)	Voltage to Pin 9	±6	V
V(10–16)	Voltage to Pin 10	±6	V
V(11–16)	Voltage to Pin 11	13.2	V
$I_{2M} = -I_{3M}$	Current ai Pins 2 and 3 (with thyristor)	650	mA
$I_{2M} = I_{3M}$	Current ai Pins 2 and 3 (with transistor)	400	mA
I(4)	Current to Pin 4	1	mA
I(6)	Current to Pin 6	±10	mA
I(7)	Current to Pin 7	-10	mA
I(11)	Current to Pin 11	2	mA
P_{tot}	Power Dissipation	800	mW
T_{oper}	Operating Ambient Temperature	-20, +70	°C
T_{stg}	Storage Temperature	-25, +125	°C

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ELECTRICAL OPERATING CHARACTERISTICS

(T_{amb} = 25°C, V_1–V_{16} = 12V , unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{9-16}	Input Signals Synchro Separator (Pin 9) Input Threshold Voltage		0.8		V
I_9	Input Threshold Current			5	µA
I_9	On-state Input Current		5 to 100		µA
I_9	Disconnect Input Current	100	150		µA
I_9	Off-state Input Current (V_{9-16} = – 5V)			– 1	µA
V_9	Video Input Signal (positive synchro pulses) (note 1)		3 to 4		V_{PP}
V_{10-16}	Noise Separator (Pin 10) Input Threshold Voltage		1.4		V

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Note : 1. Allowed range 1 to 7V



ELECTRICAL OPERATING CHARACTERISTICS

(T_{amb} = 25°C, V_1–V_{16} = 12V , unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
I_{10}	Input Threshold Current	100	150		µA
I_{10}	Input Current		5 to 100		µA
I_{10}	Off-state Input Current (V_{10-16} = – 5V)			– 1	µA
V_{10}	Video Input Signal (positive synchro pulses) (note 1)		3 to 4		V_{PP}
V_{10}	Allowed superimposed parasitic signal			7	V
V_{6-16}	Fly-back Pulse (Pin 6) Input Threshold Voltage		1.4		V
V_6	Input Limitation Level		–0.7 and +1.4		V
I_6	Input Current	0.01	1	2	mA
V_{4-16}	Output Pulse Width Control Switch (Pin 4) Input Voltage t = 7 µs (thyristor) t = 14 µs + t_d (transistor) t = 0 (V_{3-16} = 0) (note 2)		9.4 to V_{1-16} 0 to 3.5 5.4 to 6.6		V V V
I(4)	Input Current t = 7 µs (thyristor) t = 14 µs + t_j (transistor) t = 0 (V_{3-16} = 0)	200 200	 0		µA µA µA
V_{11-16}	Video Recorder Switch (Pin 11) Input Voltage (Pin 11 low level) (Pin 11 to + V_{CC})		0 to 2.5 9 to V_{1-16}		V V
I_{11}	Input Current (Pin 11 low level) (Pin 11 to + V_{CC})			200 2	µA mA
V_{8-16}	Output Signals Frame Synchro Pulses (positive) (Pin 8) Output Voltage (peak value)	10	11		V
R_8	Output Impedance		2		kΩ
t_{on}	Delay Between Leading Edge of Input Signal and Leading Edge of Output Signal		15		µs
t_{off}	Delay Between Trailing Edge of Input Signal and Trailing Edge of Output Signal		15		µs
SANDCASTLE PULSE (POSITIVE) (PIN 7)					
V_{7-16}	Output Voltage (peak valve)	10	11		V
R_7	Output Impedance		70		Ω
I_7	Output Current During Trailing Edge		2		mA
t_7	Sandcastle Pulse Width (V_7 = 7 V)	3.7		4.3	µs
Δ_t	Phase Between Middle Input Synchro Pulse and Leading Edge of Sandcastle Pulse (V_7 = 7 V)	2.15		3.15	µs
FLY-BACK BLANKING PULSE (PIN 7)					
V_{7-16}	Output Voltage (peak value)	4		5	V
R_7	Output Impedance		70		Ω
I_7	Output Current During Trailing Edge		2		mA
CONTROL PULSE FOR HORIZONTAL DRIVER (POSITIVE) (PIN 3)					
V_{3-16}	Output Voltage (peak value)		10.5		V
R_3	Output Impedance (leading edge) (trailing edge)		2.5 20		Ω Ω
t_3 t_3	Control Pulse Width V_4 = 9.4 to V_{1-16} V_4 = 0 to 4V (note 3)	5.5	 14 + t_c	8.5	µs µs
V_{1-16}	Control pulse is disabled for		4		V

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Notes : 1. Allowed range 1 to 7V
2. Or Pin 4 not connected.
3. With t_r = 12µs



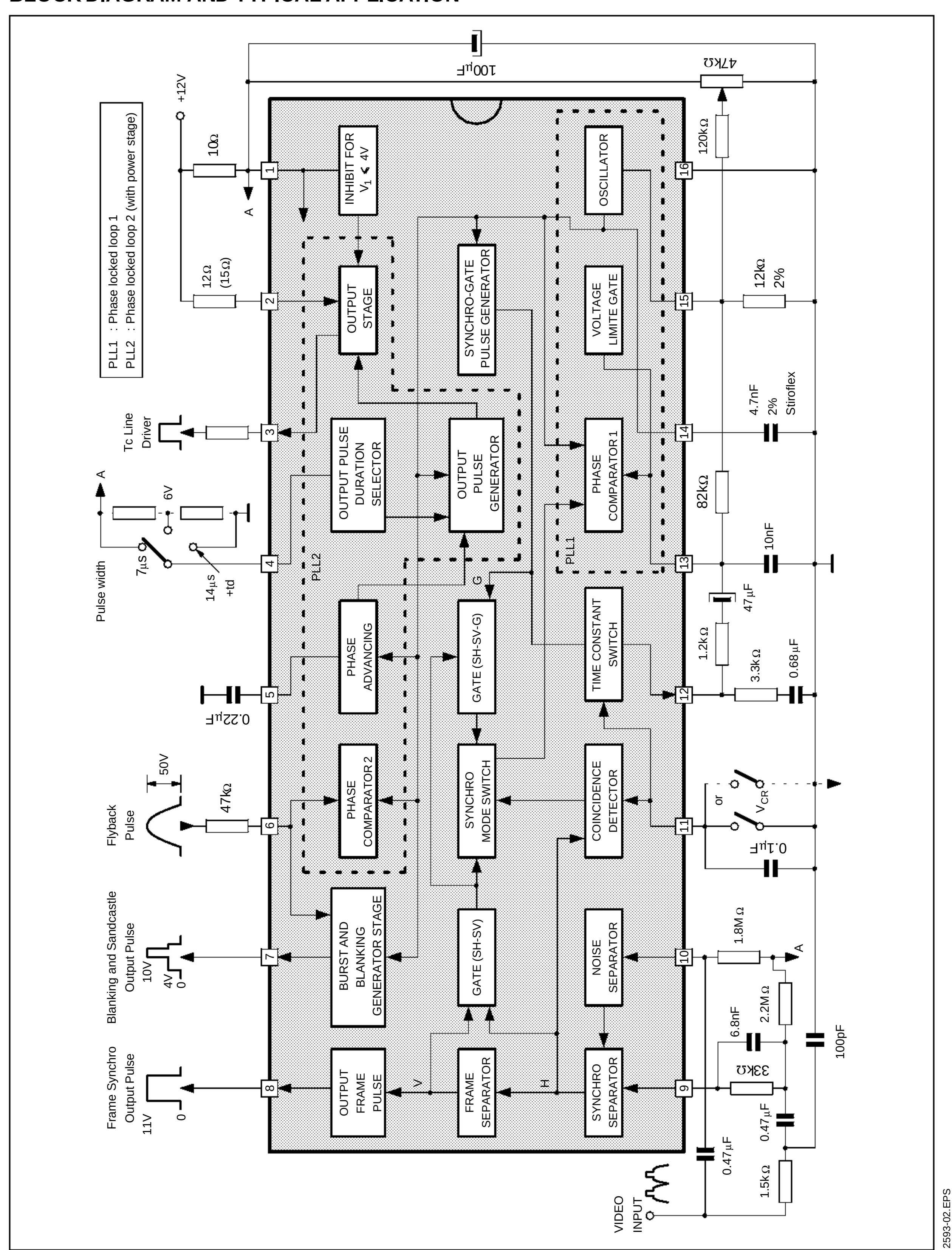
ELECTRICAL OPERATING CHARACTERISTICS (contined)
(T_{amb} = 25°C, V_1–V_{16} = 12V , unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
OVERALL PHASE RELATION SHIP					
t_z	Phrase Between Middle Synchro Pulse and Middle Fly-back Pulse (t_r = 12 µs, note 4	1.9		3.3	µs
$\Delta I/\Delta t$	Sensitivity to Current Adjust		30		µA/µs
OSCILLATOR (PINS 14 AND 15)					
V_{14-16}	Threshold Voltage (low level) (high level)		4.4 7.6		V V
I_{14}	Current Generator		± 0.47		mA
f	Free Running Frequency (C_{osc} = 4700pF, R_{osc} = 12kΩ)		15625		Hz
Δf	Tolerance on Frequency (note 5)			± 5	%
$\Delta f/15$	Frequence Control Sensitivity		31		Hz/µA
Δf	Spread of Frequency		± 10		%
$\frac{\Delta f/f}{\Delta V/V \text{ nom.}}$	nfluence of Supply Voltage on Frequency (note 5)			± 0.05	%
Δf	Frequency change when decreasing the supply down to 5 V (V_{1-16} = 5V, note 5)			± 10	%
T	Frequency Temperature Coefficient (note 5)			$\pm 10^{-4}$	Hz/°C
PHASE COMPARATOR ø 1 (PIN 13)					
V_{13-16}	Control Voltage Range		3.8 to 8.2		V
I_{13}	Control Current (peak value)		±1.9 to ±2.3		mA
I_{13}	Off-state Current (V_{13-16} = 4 to 8 V)			– 1	µA
R_{13}	Output Impedance (V_{13-16} = 4 to 8 V, note 6) (V_{13-16} < 3.8 V cr > 8.2 V, note 7)		High Low		
	Control Sensibility		2		kHz/µs
Δf	Catching and Holding Range		± 780		Hz
$\Delta f/f$	Catching and Holding Range Tolerance (note 5)		± 10		%
PHASE COMPARATOR ϕ 2 AND PHASE-SHIFT (PIN 5)					
V_{5-16}	Control Voltage Range		5.4 to 7.6		V
I_5	Control Current (peak value)		± 1		mA
I_5	Off-state Output Current (V_{5-16} = 5.4 to 7.6 V)			– 5	µA
R_5	Output Impedance (V_{5-16} = 5.4 to 7.6 V, note 6) (V_{5-16} < 5.4 V or > 7.6 V)		High 8		 kΩ
t_d	Max. delay Between Output Pulse Leading Edge and Fly-back Pulse Trailing Edge (t_r = 12 µs)			15	µs
$\Delta_t/\Delta t_d$	Static Control Error			0.2	%
COÏNCIDENCE DETECTOR (PIN 11)					
V_{11-16}	Output Voltage		0.5 to 6		V
I_{11}	Output Current (without coïncidence) (with coïncidence)		0.1 – 0.5		mA mA
TIME CONSTANT SWITCH (PIN 12)					
V_{12-16}	Output Voltage		6		V
I_{12}	Output Current		± 1		mA
R_{12}	Output Impedance (V_{11-16} = 2.5 to 7 V) (V_{11-16} < 1.5 or > 9 V)		100 60		Ω kΩ
PULSE GENERATOR (INTERNAL)					
t	Pulse Width		7.5		µs

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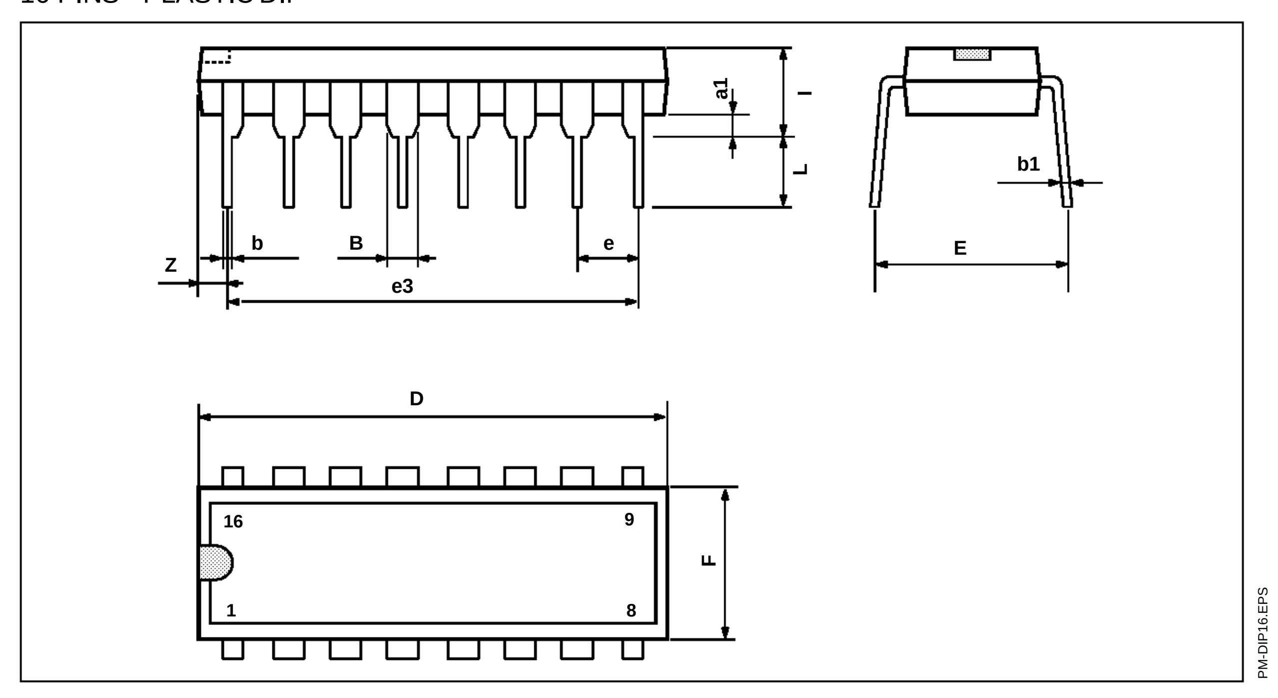
Notes : 4. The adjustement of overall phase relation (and output pulse leading edge position) is automatically performed by phase comparator Ø 2. If additional adjustement is needed, a current have to be imposed at pin 5.
5. Tolerance of peripheral components not included.
6. Current generator.
7. Emitter-follower

BLOCK DIAGRAM AND TYPICAL APPLICATION



PACKAGE MECHANICAL DATA

16 PINS - PLASTIC DIP



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

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